

Next Generation Science Standards for CA Public Schools

HS-PS1 Matter and Its Interactions

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Students who demonstrate understanding can:		
HS-PS1-5. Apply scientific principles and evidence to provide an explanation about the effects of changing the temperature or concentration of the reacting particles on the rate at which a reaction occurs. [Clarification Statement: Emphasis is on student reasoning that focuses on the number and energy of collisions between molecules.] [Assessment Boundary: Assessment is limited to simple reactions in which there are only two reactants; evidence from temperature, concentration, and rate data; and qualitative relationships between rate and temperature.]		
The performance expectations above were developed using the following elements from the NRC document <i>A Framework for K–12 Science Education</i> :		
Science and Engineering Practices Constructing Explanations and Designing Solutions Constructing explanations and designing solutions in 9–12 builds on K–8 experiences and progresses to explanations and designs that are supported by multiple and independent student-generated sources of evidence consistent with scientific ideas, principles, and theories. <ul style="list-style-type: none">Apply scientific principles and evidence to provide an explanation of phenomena and solve design problems, taking into account possible unanticipated effects. (HS-PS1-5)	Disciplinary Core Ideas PS1.B: Chemical Reactions <ul style="list-style-type: none">Chemical processes, their rates, and whether or not energy is stored or released can be understood in terms of the collisions of molecules and the rearrangements of atoms into new molecules, with consequent changes in the sum of all bond energies in the set of molecules that are matched by changes in kinetic energy. (HS-PS1-5)	Crosscutting Concepts Patterns <ul style="list-style-type: none">Different patterns may be observed at each of the scales at which a system is studied and can provide evidence for causality in explanations of phenomena. (HS-PS1-5)
Connections to other DCIs in this grade-band: HS.PS3.A (HS-PS1-5)		
Articulation to DCIs across grade-bands: MS.PS1.A (HS-PS1-5); MS.PS1.B (HS-PS1-5); MS.PS2.B (HS-PS1-5); MS.PS3.A (HS-PS1-5); MS.PS3.B (HS-PS1-5)		
California Common Core State Standards Connections:		
ELA/Literacy –		
RST.11-12.1	Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account. (HS-PS1-5)	
WHST.11-12.2	Write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical processes. (HS-PS1-5)	
Mathematics –		
MP.2	Reason abstractly and quantitatively. (HS-PS1-5)	
N-Q.1-3	Reason quantitatively and use units to solve problems. ★ (HS-PS1-5)	

*The performance expectations marked with an asterisk integrate traditional science content with engineering through a Practice or Disciplinary Core Idea.

**California clarification statements, marked with double asterisks, were incorporated by the California Science Expert Review Panel

The section entitled “Disciplinary Core Ideas” is reproduced verbatim from *A Framework for K–12 Science Education: Practices, Cross-Cutting Concepts, and Core Ideas*.

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